General Physics
RELATIVISTIC RESONANCE OF DRIVEN HARMONIC OSCILLATORS*

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The impact of relativity on the maximum velocity of a driven harmonic oscillator under near resonant conditions is investigated. We find that the shape of the resonance profile is characterized by a very abrupt asymmetric drop [1] as a function of the frequency of the external force field. We explore the corresponding orbits within a small amount of deviation to either side of the drop and find that the separation between the orbits in phase space diverges exponentially for certain periods of time followed by periods of exponential convergence. The physics of such a non-linear behavior seems to be universal both in the velocity as well as the coordinate variables. [2]

[1] R.E. Wagner, Q. Su and R. Grobe, **Phys. Rev. Lett.** 84, 3282 (2000).

[2] K. Carr, J. Henderson, M.V. Fedorov, Q. Su and R. Grobe, **Phys. Rev. A**, in preparation.